APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,072	09/28/2001	Jerome R. Bellegarda	004860.P2638	4892

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EXAMINER
SKED, MATTHEW J

ART UNIT	PAPER NUMBER
2655	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/967,072	BELLEGARDA, JEROME R.
	Examiner	Art Unit	
	Matthew J. Sked	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 September 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34 and 36-56* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10-14,21-25,32-34, 36, 37,44-48,55 and 56* is/are rejected.

7)☒ Claim(s) *4-9,15-20,26-31,38-43 and 49-54* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's arguments with respect to claims 1-56 have been considered but are

moot in view of the new ground(s) of rejection, necessitated by amendment.

Claim Objections

2.   Claims 44 and 45 are objected to because of the following informalities: the

claims depend upon canceled claim 35. For the purposed of Examination it will be

assumed that claims 44 and 45 should depend upon claim 34.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 1-3, 11-14, 22-25, 33, 46-48 and 56 are rejected under 35 U.S.C. 102(e)

as being anticipated by Holt et al. (U.S. Pat. 6,701,305).

As per claims 1, 12, 23 and 46, Holt teaches a method, apparatus, system and

computer-readable medium for generating a database comprising:

generating a latent semantic analysis space from a training corpus of documents
representative of a language, wherein the LSA space includes one or more document
vectors (term-by-document matrix is built from a set of documents, this matrix is then
decomposed into a lower dimensional subspace which includes document vectors, col.
11, line 25 to col. 12, line 19);

receiving a new document that represents a change in the language (new
documents are added to the document collection, col. 12, lines 20-32); and

adapting the LSA space to reflect the change in the language, wherein the
change in the language includes changing a position of the one or more document
vectors (a new term-by-document matrix is computed for the new documents which is
used to determine a normalized residual which is used to alter the original subspace
hence changing the position of the vectors in the subspace, col. 12, lines 20-47).

5.   As per claims 2, 13, 24 and 47, Holt teaches adapting the LSA space to reflect
the change in the language comprises transforming the LSA space to take into account
the new document's influence on the LSA space without re-computing the LSA space (a
new term-by-document matrix is computed for the new documents to determine a
normalized residual which is used to alter the original subspace hence transforming the
subspace rather than re-computing it, col. 12, lines 20-47).

6.   As per claims 3, 14, 25 and 48, Holt teaches wherein transforming the LSA
space comprises:

obtaining a training document vector that characterizes a semantic position of the training document within the LSA space (defines subspace representation of term-by-document matrix, col. 11, line 51 to col. 12, line 19);

computing a new document vector that characterizes a semantic position of the new document within the LSA space (term-by-document matrix for new documents is computed, col. 12, lines 20-32);

deriving a document vector transformation matrix (projects the term-by-document for the new documents on the original subspace to obtain a normalized residual, col. 12, lines 33-47); and

applying the document vector transformation matrix to the training document vector and the new document vector to shift a position of each document vector in the LSA space, where the shift in position reflects the change in the language (applies the normalized residual to augment the subspace, col. 12, lines 33-47).

7.   As per claims 11, 22, 33 and 56, Holt teaches the change in the language is a change in the language's style (subspace captures the latent semantic structure of the documents hence the new documents changing the subspace means the new documents would have a different semantic style, col. 11, lines 51 to col. 12, line 47).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 10, 21, 32 and 55 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Holt in view of Hazlehurst (U.S. Pat. 6,289,353).

Holt does not teach the change in language is a change in the language's

domain.

Hazlehurst teaches changing a vector space by a change in a new document

where the change in language is a change in the language's domain (vector spaces for

AIDS and cancer concepts, col. 5, lines 52-60).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify the system of Holt so that the change in language is a change in the

language's domain as taught by Hazlehurst because it allow better recovery of

documents when the system is used for multiple domains.

10.   Claims 34, 36, 37 and 45 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Marchisio (U.S. Pat. 6,862,710) in view of Holt and Foltz (U.S. Pat.

6,356,864).

As per claim 34, Marchisio teaches an apparatus for recognizing user queries

comprising:

means for recognizing an a new document (receives and parses a user's query,

col. 7, lines 24-35);

means for processing the new document using latent semantic adaptation,

wherein the means for processing include:

means for generating a latent semantic analysis space from a training corpus of documents representative of a language, wherein the LSA space includes one or more document vectors (generates a term-document matrix based on the electronic document files, wherein the rows indicate the occurrences of terms for each document hence consisting of document vectors, col. 6, lines 52-62);

means for receiving a new document that represents a change in the language (receives a user query that consists of keywords or phrases and parses these phrases to recognize acronyms and word roots hence indicating these queries would be a change in language from the training documents, col. 7, lines 24-35); and

means for adapting the LSA space to reflect the change in the language (includes the phrases in the term-document matrix hence changing the LSA space, col. 7, lines 42-61).

means, coupled to the means for processing, for semantically inferring from a vector representation of the new document which of a plurality of known words and known documents correlate to the new document (returns a list of sorted documents of most relevance to the user, col. 8, lines 29-32).

Marchisio does not teach that the change in language includes changing a position of the one or more document vectors.

Holt teaches adapting the LSA space to reflect the change in the language, wherein the change in the language includes changing a position of the one or more document vectors (a new term-by-document matrix is computed for the new documents which is used to determine a normalized residual which is used to alter the original

subspace hence changing the position of the vectors in the subspace, col. 12, lines 20-47).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Marchisio to change a position of the one or more document vectors because it would allow all the document vectors to be modified to reflect the changes the new documents indicate, hence giving a much more robust adaptable LSA space.

Marchisio and Holt do not teach using this apparatus for recognizing speech.

Foltz teaches recognizing speech as the input into a query based system using LSA (speech-to-text conversion for input, col. 10, lines 2-6).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Marchisio and Holt to allow the user to input the query by using speech as taught by Foltz because it would allow hands-free use of the system.

11.   As per claim 36, Marchisio teaches adapting the LSA space to reflect the change in the language comprises transforming the LSA space to take into account the new document's influence on the LSA space without re-computing the LSA space (includes rows in the term-document matrix of phrases from the user's query hence takes into account the new document without re-computing the LSA space, col. 7, lines 42-61).

12.   As per claim 37, Marchisio teaches obtaining a training document vector that characterizes a semantic position of the training document within the LSA space (generates a term-document matrix from the documents, col. 6, lines 52-62) and a

means for computing a new document vector that characterizes a semantic position of the new document within the LSA space (generates a user query vector, col. 7, lines 24-35).

Marchisio does not teach a means for deriving a document vector transformation matrix and means for applying the document vector transformation matrix to the training document vector and the new document vector to shift a position of each document vector in the LSA space, where the shift in position reflects the change in the language.

Holt teaches deriving a document vector transformation matrix (projects the term-by-document for the new documents on the original subspace to obtain a normalized residual, col. 12, lines 33-47); and applying the document vector transformation matrix to the training document vector and the new document vector to shift a position of each document vector in the LSA space, where the shift in position reflects the change in the language (applies the normalized residual to augment the subspace, col. 12, lines 33-47).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Marchisio to have a means for deriving a document vector transformation matrix and means for applying the document vector transformation matrix to the training document vector and the new document vector to shift a position of each document vector in the LSA space, where the shift in position reflects the change in the language as taught by Holt because it would allow the space to be changed without having to recompute the entire document space hence saving computation time.

13.   As per claim 45, Marchisio teaches the change in the language is a change in the

language's style (parses the phrase to recognize acronyms and extracting root words to

recognize various tenses and variations of verbiage hence inferring that the change is in

the style the user is communicating, col. 7, lines 42-61).

14.   Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Marchisio in view of Holt, Foltz and Hazlehurst.

        Marchisio, Holt and Foltz do not teach the change in language is a change in the

language's domain.

        Hazlehurst teaches changing a vector space by a change in a new document

where the change in language is a change in the language's domain (vector spaces for

AIDS and cancer concepts, col. 5, lines 52-60).

        It would have been obvious to one of ordinary skill in the art at the time of

invention to modify the system of Marchisio, Holt and Foltz so that the change in

language is a change in the language's domain as taught by Hazlehurst because it

allow better recovery of documents when the system is used for multiple domains.

Allowable Subject Matter

15.   Claims 4-9, 15-20, 26-31, 38-43, and 49-54 are objected to as being dependent

upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims.

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Shanahan et al. (U.S. Pat. Pub. 2005/0022114A1) teaches a

document management system that updates the LSA space when new documents are

entered. Achlioptas et al. (U.S. Pat. 6,807,536) teaches updating the LSA space.

Thawonmas et al. (U.S. Pat. 6,882,747) teaches updated the term-document matrix.

17.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-

7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

MS
12/02/05

W. R. YOUNG
PRIMARY EXAMINER